

RECEIVED  
CENTRAL FAX CENTER

MAR 30 2007

Amendments to the Claims:

1. (Currently amended) A method of detection in a multiple-input, multiple-output wireless communication system, comprising the steps of:
  - (a) receiving a signal representing a set of  $P$  symbols, one symbol transmitted from each of  $P$  antennas where  $P$  is a positive integer greater than 2;
  - (b) jointly estimating a subset of  $P_1$  symbols of said set of  $P$  symbols where  $P_1$  is a positive integer;
  - (c) after step (b), jointly estimating a subset of  $P_2$  symbols of said set of  $P$  symbols where  $P_2$  is a positive integer and wherein said subset of  $P_1$  symbols and said subset of  $P_2$  symbols are members of a partition of said set of  $P$  symbols and  $P_1 + P_2$  is greater than 2 and wherein  $P_1 = P_2 = P/2$  when there are 2 antennas.
2. (Cancelled)
3. (Original) The method of claim 1, further comprising:
  - (a) after step (c) of claim 1, for each  $m$  in the set  $\{3, \dots, M\}$ , jointly estimating a subset of  $P_m$  symbols of said set of  $P$  symbols where  $P_m$  is a positive integer and wherein said subset of  $P_m$  symbols is a member of a partition of said set of  $P$  symbols and  $P_1 + P_2 + \dots + P_M = P$  where  $M$  is a positive integer.
4. (Original) The method of claim 3, wherein:
  - (a)  $P_1 = P_2 = \dots = P_M = P/M$ .
5. (Original) The method of claim 1, wherein:
  - (a) said jointly estimating of step (b) of claim 1 includes a decision using  $P_1$ -vector of soft estimates  $\mathbf{F}_1 \mathbf{r}$  where  $\mathbf{r}$  is a  $Q$ -vector of said received signals of step (a) of claim 1 and  $\mathbf{F}_1$  is a  $P_1 \times Q$  matrix for zero-forcing estimation;
  - (b) said jointly estimating of step (c) of claim 1 includes a decision using  $P_2$ -vector of soft estimates  $\mathbf{F}_2 (\mathbf{r} - \mathbf{G}_1 \mathbf{s}^{(1)})$  where  $\mathbf{F}_2$  is a  $P_2 \times Q$  matrix for zero-forcing estimation,  $\mathbf{G}_1$  is a  $Q \times P_1$

TI-34889, Page 2

matrix for zero-forcing feedback cancellation, and  $s^{(1)}$  is the  $P_1$ -vector estimation result of step (b) of claim 1.

6. (Original) The method of claim 1, wherein:

(a) said jointly estimating of step (b) of claim 1 includes a decision using  $P_1$ -vector of soft estimates  $F_1 r$  where  $r$  is a  $Q$ -vector of said received signals of step (a) of claim 1 and  $F_1$  is a  $P_1 \times Q$  matrix for minimum mean square error estimation

(b) said jointly estimating of step (c) of claim 1 includes a decision using  $P_2$ -vector of soft estimates  $F_2 (r - G_1 s^{(1)})$  where  $F_2$  is a  $P_2 \times Q$  matrix for minimum mean square error estimation,  $G_1$  is a  $Q \times P_1$  matrix for zero-forcing feedback cancellation, and  $s^{(1)}$  is the  $P_1$ -vector estimation result of step (b) of claim 1.

7. (Original) The method of claim 1, wherein:

(a) said jointly estimating of step (b) of claim 1 includes a decision using  $P_1$ -vector of soft estimates  $F_1 r$  where  $r$  is a  $Q$ -vector of said received signals of step (a) of claim 1 and  $F_1$  is a  $P_1 \times Q$  matrix for minimum mean square error estimation

(b) said jointly estimating of step (c) of claim 1 includes a decision using  $P_2$ -vector of soft estimates  $F_2 (r - G_1 s^{(1)})$  where  $F_2$  is a  $P_2 \times Q$  matrix for minimum mean square error estimation including feedback error compensation,  $G_1$  is a  $Q \times P_1$  matrix for zero-forcing feedback cancellation including feedback error compensation, and  $s^{(1)}$  is the  $P_1$ -vector estimation result of step (b) of claim 1.

8. (Original) The method of claim 1, wherein:

(a) said subset of  $P_1$  symbols of step (b) of claim 1 is determined according to signal-to-interference-plus-noise ratios of said  $P$  symbols prior to a decision in said estimating.

9. (Original) The method of claim 1, wherein:

(a) said subset of  $P_1$  symbols of step (b) of claim 1 is determined according to projected signal-to-interference-plus-noise ratios of said  $P$  symbols after a decision in said estimating.

10. (Original) The method of claim 1, wherein:  
(a) said jointly estimating of step (b) of claim 1 includes a maximum likelihood decision;  
and  
(b) said jointly estimating of step (c) of claim 1 includes a maximum likelihood decision.
11. (Original) The method of claim 1, wherein:  
(a) said jointly estimating of step (b) of claim 1 includes a soft decision; and  
(b) said jointly estimating of step (c) of claim 1 includes a soft decision.
12. (Original) The method of claim 1, further comprising:  
(a) jointly re-estimating said subset of  $P_1$  symbols using error compensation determined by said jointly estimating said subset of  $P_2$  symbols of step (c) of claim 1.